REMARKS/ARGUMENTS

In view of the foregoing amendments and the following remarks, the applicants respectfully submit that the pending claims are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. **If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicants respectfully request that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.**

The applicants will now address each of the issues raised in the outstanding Office Action.

Rejections under 35 U.S.C. § 103

Claims 1-16, 18-21, 23-44 and 46-49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Moy, "Network Working Group RFC 1583," OSPF Version 2 (March 1994) ("the Moy paper"), and Sandwick et al., "Network Working Group Internet Draft," Fast LIveness Protocol (FLIP) (February 2000) ("the Sandick paper"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

First, since claims 23-28 have been canceled, this ground of rejection is rendered moot with respect to these claims.

Next, in rejecting independent claims 1 and 29, the Examiner contends that the Moy paper teaches accepting forwarding liveness status information, composing a message including the forwarding liveness status information, and sending the messages towards a neighbor node. (See Paper No. 20080714, page 3.) Although the Examiner concedes that the Moy paper does not disclose accepting forwarding liveness status information ***of at least two different interfaces***, the Examiner contends that the list of neighbor interfaces included in a FLIP Advertisment Message described in the Sandick paper teaches accepting forwarding liveness status information ***of at least two different interfaces***. The applicants respectfully disagree.

Embodiments consistent with the claimed invention may be used to provide a "liveness detection mechanism" for quickly detecting a down interface used by nodes on a network by exchanging messages which include aggregated protocol and/or forwarding liveness ("APFL") ***status*** information with neighboring nodes. The APFL ***status*** information may contain, for example, the status of the at least two different interfaces used by the nodes. This feature provides several advantages. As the specification states:

> hello messages [in conventional liveness detection mechanisms] often carry more than just liveness information, and can therefore be fairly large and require non trivial computational effort to process. Consequently, running fast liveness detection between a pair of neighbor nodes, ***each running multiple protocols***, can be expensive in terms of

> communications and computational resources required to communicate and process the frequent, lengthy messages for liveness detection. [Emphasis added.]

(Paragraph [0009] of the present application) These conventional liveness detection mechanisms require separate Hello messages for each different interface used by the node. The ability to send ***aggregated forwarding liveness status information of multiple interfaces*** overcomes this issue as follows:

> By providing a small number of bits per protocol, which relay a simple set of information (***such as up, down, not reporting, restarting***, etc.), a compact, simple message may be used for ***conveying liveness related information***. Since the messages are small ***and can aggregate information from more than one protocol, they can be sent frequently***. [Emphasis added.]

(Paragraph [0086] of the present application) As can be appreciated from the foregoing, the forwarding liveness ***status*** information of at least two different interfaces can be aggregated into a single message wherein each of the state of the interface may be set to up, down, not reporting or restarting.

By contrast, the Sandick paper includes a "list of neighbor interfaces that the transmitting device has heard from." (Section 4.2 of the Sandick paper.) The described list is "[a] list of all source IP addresses of all FLIP Advertisements that have been heard on this interface". (Section B.1 of the Sandick paper.) ***This list of neighbor interfaces that the transmitting device has heard from does <u>not</u> indicate the <u>status</u> of the***

neighbor interfaces. Rather, in the Sandick paper, a node can only infer that status of its own interface with the neighbor node. Specifically, the Sandick paper provides:

> When a device receives a FLIP Advertisement from a neighbor, it lists the neighbor interface in its own FLIP advertisements for that interface. If a device receives an advertisement containing its own interface in one of the neighbor fields and it has listed that neighbor in its own advertisement, a FLIP adjacency is established. If an advertisement containing the receiving device interface has not been received from a neighbor in FLIPAdvertismentDeadInterval seconds, then that neighbor is removed from subsequent advertisements (for that interface) and the adjacency is considered down.

(Section 4.5 of the Sandick paper.) As can be appreciated from the foregoing, even though a FLIP Advertisement message may include a ***list*** of all source IP addresses of all nodes that the transmitting node has heard from, ***the receiver node can only infer the status of its interface with the sending node***. That is, the inclusion source IP addresses in the FLIP Advertisement do not provide the ***status*** of the source nodes. Thus, the Sandick paper neither teaches, nor makes obvious, accepting forwarding liveness ***status*** information of at least two different interfaces (e.g., ***which indicates whether the at least two interfaces are up, down, not responding, or restarting***) and composing an aggregated message including the forwarding liveness status

information of the at least two different interfaces as data within the aggregated message.

Furthermore, the purported teachings of the Moy paper do not compensate for the aforementioned deficiencies of the Sandick paper.

Thus, independent claims 1 and 29, as amended, are not rendered obvious by the Moy and Sandick papers for at least this reason. Independent claims 11, 18, 39 and 46, as amended, are similarly not rendered obvious by the Moy and Sandick papers. Since claims 2-10 directly or indirectly depend from claim 1, since claims 12-16 directly or indirectly depend from claim 11, since claims 19-21 depend from claim 18, since claims 30-38 directly or indirectly depend from claim 29, since claims 40-44 depend from claim 39, and since claims 47-49 depend from claim 46, these claims are similarly not rendered obvious by the Moy and Sandick papers.

Claims 17, 22, 45 and 50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Moy and Sandick papers, and further in view of Simpson, "Network Working Group RFC 1989," PPP Link Quality Monitoring (August 1996) ("the Simpson paper").

Claims 17, 22, 45 and 50 depend from claims 11, 18, 39 and 46, respectively. Since the purported teachings of the Simpson paper do not compensate for the deficiencies of the Moy and Sandick papers with respect to claims 11, 18, 39 and 46 as amended (discussed above), these claims are not rendered obvious by the Moy, Sandick and Simpson papers, regardless of the purported teachings of the Simpson paper, and regardless of the presence or

absence of an obvious reason to combine these references as proposed by the Examiner.

Claim amendments

In addition to the claim amendments discussed above, claims 29, 30, 36, 37, 39, 40, 46 and 47 have been amended to replace means-plus-function elements and to include one or more processors, at least one input, and one or more storage devices storing processor-executable instructions which, when executed by one or more processors, perform a method. These amendments are supported, for example, by Figure 6 and paragraphs [0048]-[0050] of the present application.

New claims

New claims 51 and 52 depend from independent claim 1 and new claims 53 and 54 depend from independent claim 29. These claims are supported by original claims 10 and 38 and paragraph [0044] of the present application.

Conclusion

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Any arguments made in this amendment pertain ***only*** to the specific aspects of the invention ***claimed***. Any claim amendments or cancellations, and any arguments, are made ***without prejudice to, or disclaimer of***, the applicants' right to seek patent protection of any unclaimed (e.g., narrower, broader, different) subject matter, such as by way of a continuation or divisional patent application for example.

Since the applicants' remarks, amendments, and/or filings with respect to the Examiner's objections and/or rejections are sufficient to overcome these objections and/or rejections, the applicants' silence as to assertions by the Examiner in the Office Action and/or to certain facts or conclusions that may be implied by objections and/or rejections in the Office Action (such as, for example, whether a reference constitutes prior art, whether references have been properly combined or modified, whether dependent claims are separately patentable, etc.) is not a concession by the applicants that such assertions and/or implications are accurate, and that all requirements for an objection and/or a rejection have been met. Thus, the applicants reserve the right to analyze and dispute any such assertions and implications in the future.

Respectfully submitted,

December 24, 2008

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I hereby certify that this paper (and any accompanying paper(s)) is being facsimile transmitted to the United States Patent Office on the date shown below.

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December 24, 2008
Date